An interesting paper on Indian types of beauty was read some time ago by Mr. R. W. Shufeldt, before the Philosophical Society of Washington, and has now been issued as a pamphlet. It is admirably illustrated.

Mr. A. G. Howes, British Consul at Tahiti, in his latest annual report to the Foreign Office, has the following note respecting pearl-shell diving in Tahiti:—Since the introduction of the diver's dress and apparatus at the pearl fisheries in 1890 a considerable increase in the export of shell has been maintained over the previous years. A strong feeling has, however, been exhibited by the natives, who adhere to their own system of diving, against this means of taking the shell, and has resulted in a communication being made by the Director of the Interior of the colony to the Chamber of Commerce at this place, recommending the gradual abolition of the diving dress and apparatus and the stoppage of further issue of patents for the same, from January 1, 1893. The Chamber of Commerce have expressed their approval of the suggestion, but consider that an entire and not gradual abolition of the diving dress and apparatus should take place, and they have decided to lay this proposal before the Conseil-Général when it assembles next August. The reasons set forth by the Chamber of Commerce for adopting this course are that the regulations for the use of the diving dress and apparatus have been abused. They state that French citizens, contrary to rule, have under their name employed diving dress and apparatus owned by foreigners; that the law prohibiting pearl fishing by this means in a depth of less than ten fathoms had not been adhered to, and they also give as their opinion that the shells found in a greater depth than ten fathoms are those mostly important for reproduction, and to destroy them will ruin the fisheries and bring distress upon the natives who depend upon the pearl-shell diving for their livelihood.

The additions to the Zoological Society's Gardens during the past week include a Common Marmoset (*Hapale jacchus*) from South-east Brazil, presented by Mr. Gerald F. Youll; an African Civet Cat (*Viverra civetta*), a white-tailed Ichneumon (*Herpestes albicauda*), two Ostriches (*Struthio camelus* ♀ ♀) from East Africa, presented by Mr. F. Pardage; a Pine Marten (*Mustela martes*), British, presented by Mr. Harold Hanauer, F.Z.S.; three North American Turkeys (*Meleagris gallo-pavo*) from North America, presented by Col. H. W. Feilden, C.M.Z.S.; two Rufous-necked Wood Doves (*Haplopelia larvata*) from South Africa, presented by Mr. W. H. Wormald; a Grand Eclectus (*Eclectus roratus*) from Moluccas, presented by Messrs. Chas. and Walter Seton; two Red-crested Cardinals (*Paroaria cucullata*) from South America, presented by Miss Edith M. Fox; a Common Chameleon (*Chamæleon vulgaris*) from North Africa, presented by Mast. S. E. Thorns; a Large Brown Flying Squirrel (*Pteromys oral*) from the Shevaroy Hills, South India, three American Bisons (*Bison americanus* ♀ ♀ ♀) from North America, a Barraband's Parrakeet (*Polytelis barrabandi*) from New South Wales, deposited; a Mongoose Lemur (*Lemur mongoz*) from Madagascar, purchased; an American Bison (*Bison americanus* ♀) from North America, received in exchange.

OUR ASTRONOMICAL COLUMN.

Madras Observatory.—This year being the centenary of the founding of the Madras Observatory, the officiating astronomer, Mr. C. Michie Smith, prefaces his report with a brief historical sketch. It seems that the East India Company were the first to propose the establishment of such an Observatory, but Sir Charles Oakeley, taking time by the forelock, and, as we are informed, anticipating the orders from the India Office, set about constructing it on his own authority. With the aid of Mr. William Petrie, who placed his own observatory at their disposal, the scheme was soon brought to a practical head, and by the time the orders arrived in 1792 the Observatory, besides being actually built, contained many instruments. The first astronomer was Mr. J. Goldingham. Mr. Thomas Glanville Taylor, F.R.S., was Director of the Observatory from 1830 to 1848. After erecting new instruments, he began his catalogue of 11,000 stars, publishing it in the year 1844. Hourly meteorological and magnetic observations were also carried on by him. He died in England in May 1848, having never completely recovered from a serious injury caused by a fall. In 1849 Captain W. S. Jacob was appointed astronomer; he made a new departure in the form of extra-meridional observations. Owing to ill-health Captain Jacob resigned his appointment in 1859, and during the next two years the office was held partly by Major W. K. Worster, R.A., and Major (now General) J. F. Tennant, R.E. About this time the work of the observatory was delayed, as more modern instruments were being erected, and it was not till May 1862 that the new transit circle of 5 inches aperture and 42-inch circle was ready for use. The late Mr. N. R. Pogson, who had then arrived in Madras as Government Astronomer, commenced his catalogue of 5,000 stars, observing each at least 5 times. He also used very considerably the 8-inch equatorial. The present astronomer, Mr. C. Michie Smith, in his report, suggests a further increase of the observatory equipment.

Oxford University Observatory.—During last month the seventeenth annual report of the Savilian Professor of Astronomy was presented to the Board of Visitors of the University Observatory. This report showed that the work of the Observatory during the past year has been very considerable. The Grubb equatorial, the transit circle, and the De la Rue equatorial have been severally occupied, while the new micrometer for the Grubb instrument has worked efficiently, and forms a valuable addition to the resources of the Observatory. The work upon the international chart has formed one of the important features throughout the year, and for the measurement of the photographic plates a new and costly form of micrometer had to be devised; the réseaux have not proved to be very enduring, so that in consequence a new one had to be obtained from Messrs. Gautier of Paris. The work connected with stellar parallax has now been completed after a period of four years' hard work, and this fact deserves the highest consideration in face of the magnitude of the staff and the amount of work done. The manuscript consists of (1) the concise but complete history of all effective researches in stellar parallax up to the present date; (2) the results of the parallax work completed in this Observatory, extending on the whole to some thirty stars; (3) a catalogue of all parallactic determinations effected by other astronomers. Among some of the other work commenced or completed during the present year we may mention the photometric catalogues of stars of the ninth and eleventh magnitudes within small specified areas for the eighteen Observatories engaged in the international chart, observations of Nova Aurigæ, and the investigation of the amount of light "lost by the moon at the commencement and termination of the lunar total eclipse on November 15, 1891." The finances of the Observatory at present, owing to previous economy, seem to cover the expenditure, but Prof. Pritchard seems to refer to the fact that the quinquennial grant expires at the end of the present year, as if next year the University will be called upon to make a slight additional increase to counterbalance the cost of the instrumental equipment that has been required for the chart work. We are glad to note that at this meeting of the Board Prof. Pritchard was able to attend, having completely recovered from his illness.

GEOGRAPHICAL NOTES.

M. Dybowski has returned to France in bad health. His last work in the French Congo territory was an expedition up the Ubangi to avenge the murder of M. Crampel.

The Royal Belgian Society of Geography has of late been devoting special attention to home affairs, and in particular to the publication of more or less exhaustive monographs of the local geography of the communes. The last number of their *Bulletin* contains an able summary of the geography of the commune of Familleureux, under the main heads of physical, economic, administrative geography and history, with carefully planned subdivisions. By multiplying such studies, the material for a really exhaustive geography of the country will be obtained. Some such scheme might well be applied to the United Kingdom, where a series of county geographies on a definite system and rigorously edited would be peculiarly

© 1892 Nature Publishing Group

advantageous. The idea was present in Sir John Sinclair's famous "Statistical Account," but has had no recent or adequate embodiment.

THE *Scottish Geographical Magazine* for July contains a translation by Mr. C. E. D. Black of M. Dauvergne's recent journey in the Pamirs, the original paper appearing simultaneously in the *Bulletin* of the Paris Geographical Society. The journey carried out in 1889-90 was a most successful one and opened up some new ground. The geographical results are summed up in four sentences:—(1) That there is another great chain running parallel to the Kuen Lun and facing Kashgaria. (2) That the river in the Tung valley is an affluent of the Zarafshan, not of the Taghdumbash. (3) That the Oxus rises in the great glaciers of the Hindu Kush at 37° 10′ N. and 75° E. (4) That the Karambar valley, although difficult, is practicable for ponies.

DR. THEODOR MENKE, one of the best known of German historical geographers, died in Gotha in May last. His work in the compilation of atlases of historical geography was exceptionally thorough. His first work in this direction was a popular school atlas of classical geography, entitled "Orbis Antiqui Descriptio"; but his most important contribution to cartography was his edition of Spruner's great historical atlas, begun in 1858 and completed in 1879.

DR. STUHLMANN, according to a telegraphic report in the *Times*, has furnished additional particulars of Emin Pasha's expedition, although no more recent news. The real and only aim of Emin's journey to the Equatorial province, was to rescue those of his former subordinates, whose vacillation and delays kept them from joining Stanley's march to the coast. It was then his purpose to make his way across Africa to Adamawa and the Cameroons, a purpose which, as we already know, he had to abandon. It is satisfactory to learn that Dr. Stuhlmann had with him at Bukoba all the valuable scientific records and collections of the expedition.

THE current number of *Petermann's Mitteilungen* calls attention to a curious literary fraud to which in the two previous numbers it fell a victim, and from which many geographical journals in the habit of faithfully reproducing the articles of *Petermann* also suffer. A Dr. Ceyp professed to have made a journey recently in south-eastern Persia, and communicated to *Petermann* a detailed account of it, which now appears to have been copied verbatim from a little-known work, "Gasteiger-Khans," reprinted from the "Boten für Tirol und Vorarlberg," 1881. General Houtum Schindler, of Teheran, who knew that Ceyp's Persian travels had not led him beyond that city, gave the information which led to this discovery. The episode furnishes a fresh proof of the necessity for the great caution in accepting the records of unknown travellers which has always been exercised by the leading English authorities.

THE BEARING OF PATHOLOGY UPON THE DOCTRINE OF THE TRANSMISSION OF ACQUIRED CHARACTERS.

FOR more than two years the English public has been in possession of an excellent translation of sundry of Weismann's more important essays.[1] The object of this paper is not to expound Weismann's views generally. That office has already been undertaken by the persons best qualified to perform it.[2] We propose merely to discuss one of his topics under a single aspect—the "Transmission of Acquired Characters" in its relations to pathology.

We cannot, however, avoid reviewing some of the leading points in Weismann's system which bear upon our immediate topic.

At the root of the matter lies the all-important distinction between reproductive and somatic cells. Saving among the lowest forms of animal life, an organism may be regarded as made up of two parts. There are the reproductive cells. With these the future of the species lies. They are the visible basis of its perpetuity. The remaining tissues of the body are styled "somatic." It is natural to us to think of the "somatic" tissues as something higher and nobler than the reproductive cells—to contrast the simplicity of the latter in structure and endowment with the intricacy of the former. But there is another point of view, which inverts matters; which regards the somatic tissues—the body and its manifold endowments—simply as a sort of living case or appendage of the reproductive cells. The reproductive cells look after the perpetuity of the species, the somatic cells look after the reproductive cells.

Now, if we travel back to the simplest forms of animal life, we lose sight of this distinction. The principle of differentiation of labour is not yet recognized. Among the Protozoa the distinction between reproductive and somatic cells has no place. Every part of the organism has it in its power to reproduce the entire organism. No special material is reserved to serve the purposes of reproduction. As we ascend in the scale of animal life, differentiation of labour begins. There is from the outset a reservation of reproductive cells, which serve as the demonstrable links between successive generations of organisms. But in sundry of the highest forms of animal life a third condition obtains. There is at the outset no reservation of cells: differentiation overtakes the entire organism—there is no exemption.

Not till the close of embryonic life do the reproductive cells appear, and when they do so it is as the offspring of somatic cells. This third condition was felt by Weismann as a difficulty, and led to an important modification in his terminology. The problem he had to explain was this, How can cells which have apparently lost their reproductive characters afterwards regain them? The solution he found was that the differentiation undergone by certain cells was never in reality thoroughgoing enough to deprive them of their original characters. Sooner or later, a moment arrives at which the original "germ-plasm" becomes again predominant. Instead, then, of in "germ-cells," the basis of perpetuity of the species is laid in "germ-plasm."[1]

We have now to consider the bearing of these views upon the doctrine of the transmission of acquired characters.

It is of the utmost importance to understand precisely what Weismann means by the term "acquired character." Acquired characters are opposed to original characters. To grasp the distinction we are sent back to a time before the distinction between reproductive and somatic cells existed. The characters already present at this early period are original characters. Later on, the reproductive and somatic cells part company, to follow separate careers of their own. It is the somatic cells—the body—which comes chiefly into collision with the environment, and in doing so undergoes various modifications. Now these modifications are the "acquired characters" the transmissibility of which Weismann denies.

They may be something purely local, as a scar or a mutilation. They may be something which involves the modification of complex musculo-nervous mechanisms, as in delicate manipulations and tricks of skill, such as violin-playing. Now, how is it conceivable, he argues, that such specific changes in the somatic tissues should influence the reproductive cells in the same direction? Whether they influence them at all is not the matter in dispute. That they do this is not only conceivable, but highly probable. But how can the somatic cells stamp their own special characters upon the reproductive cells?

We now turn to the main topic of this paper. Has pathology anything to say, either for or against, the transmissibility of acquired characters?

Now, as to the transmissibility of sundry forms of disease there is no question. That pathological characters are transmitted is universally allowed. The difficulty, however, is to decide whether such characters were really acquired, in the strict sense in which Weismann uses the term. We shall find that it will require considerable care to adduce instances which are really appropriate. With this preliminary caution we may proceed to attempt some sort of preliminary classification of our pathological data. We shall find that they fall, roughly, into three main groups:—

(1) Morbid characters which are obviously acquired by the organism, and as obviously transmitted. But since they are in no sense the acquisition of the somatic cells as such, but of the entire organism—somatic and reproductive cells alike—they cannot be allowed to "rank."

(2) Morbid characters in which an element of transmission is obvious, but where a closer investigation reveals the fact that, supposing them to have been acquired, in Weismann's sense of

---

[1] Translation edited by E. B. Poulton, Schönland, and Shipley.

[2] Prof. Moseley's two articles in NATURE, vols. xxxiii. and xxxiv. Discussion introduced by Prof. Lankester at the meeting of the British Association, 1887.

[1] See Weismann's essay on "Foundation of a Theory of Heredity," *passim*.

© 1892 Nature Publishing Group